A pioneer probes the merits of online vs. face-to-face professional development

Q&A with **Chris Dede**

Learning,
NO MATTER WHERE YOU ARE

By Tracy Crow

JSD: When we hear about districts and schools using technology for professional development, often we'll hear about the convenience that technology offers. Yet we know that professional learning that is sustained and job-embedded in a collaborative environment delivers results for schools. What is your perspective on this?

Dede: There is no single best model for learning, either for student learning or for teacher learning. Everything we know about learning suggests that it's not something that's quite similar among people, like sleeping, but instead, something that's quite different among different people, like whom they choose to bond with. And so, some people are going to love online-only professional development, and some people are not. Some people are going to want face-to-face only, and some people are not. Some, probably many people, will like blended or hybrid models, because they give you the advantages of both. Too often the mind-set in education — not just for professional development, but in general — is that there's one best way to do this, and, if we just find that best way, then everyone's going to love it. In fact, in professional development, as in student learning, we need to think about an ecology of different types of learning that matches different people's needs and preferences so they can navigate to whatever part of that ecology for that particular goal they bring to it.

JSD: What are essential elements to creating a high-quality online learning experience?

Dede: In many ways, most of those elements are similar to what would create a high-quality face-to-face learning experience. Interactivity and individualization are central to learning, whether the experience is face-to-face or online. In a face-to-face setting, you don't want to be just sitting in lectures, you want to have lively discussions where your voice is frequently heard, and online, you don't just want to be reading PDFs or watch-
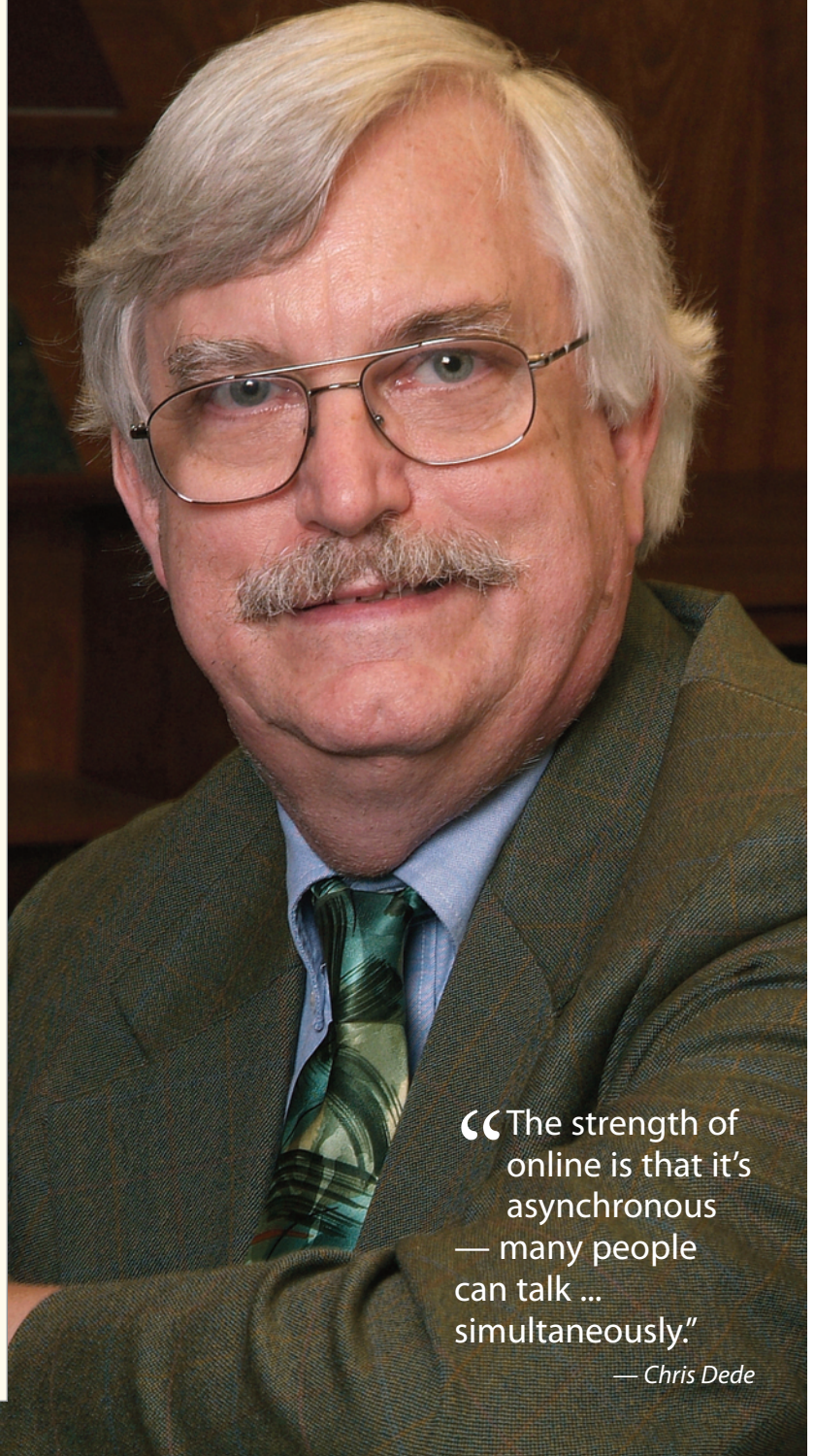
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A frequent speaker for education, research, and policy audiences, Dede's recent published work includes:

- "Building university faculty and student capacity to use wireless handheld devices for learning," by Ed Dieterle and Chris Dede. In Mark van't Hooft and Karen Swan (Eds.), *Ubiquitous Computing: Invisible Technology, Visible Impact*, 303–328. Mahwah, NJ: Lawrence Erlbaum Associates, 2007.
- "Collaborative design of online professional development: Building the Milwaukee professional support portal," by David Eddy Spicer and Chris Dede. (2006, October). *Journal of Technology and Teacher Education, 14*(4), 679-699.
- "Immersive interfaces for engagement and learning," by Chris Dede. (2009, January 2). *Science, 323*(5910), 66-69.
- "Lessons learned from studying how innovations can achieve scale," by Christopher Dede, Saul Rockman, and Allyson Knox. (2007, Spring). *Threshold*, 4-10.
- " 'Neomillennial' learning styles propagated by wireless handheld devices," by Edward Dieterle, Chris Dede, and Karen Schrier. In Miltiadis Lytras and Ambjorn Naeve (Eds.), *Ubiquitous and Pervasive Knowledge and Learning Management: Semantics, Social Networking and New Media to Their Full Potential*, 35-66. Hershey, PA: Idea Group, 2007.
- *Online Professional Development for Teachers: Emerging Models and Methods*, by Chris Dede (Ed.). Cambridge, MA: Harvard Education Press, 2006.
- "Studying situated learning in a multi-user virtual environment," by Diane Jass Ketelhut, Chris Dede, Jody Clarke, Brian Nelson, and Cassie Bowman. In Eva Baker, Jan Dickieson, Wallace Wulfeck, and Harold F. O'Neil (Eds.), *Assessment of Problem Solving Using Simulations,* 37-58. Mahwah, NJ: Lawrence Erlbaum Associates, 2007.

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— *Chris Dede*

ing streaming videos, you want to be part of a lively, interpretive community that's sorting out these different types of things. Now, one thing that is different about online and a strength of online is that it's asynchronous — many people can talk, if you will, simultaneously. That is, if everybody puts in two hours online, there will be a much richer dialogue than if everybody put in two hours face-to-face, just because face-to-face, the number of utterances is restricted. And many people, even teachers, will not talk face-to-face, but they will find their voice online.

There are also disadvantages to online. Sometimes communicating online feels like publishing to people, and so they're worried about expressing ideas that they're just sorting out, because they're afraid that the online record can come back to haunt them. Some people find that the asynchronous medium isn't a good match for them. They like the lively, semisocial interchange that face-to-face allows. Just as we need a range of pedagogies to match different styles of learning, we need a range of media to match different styles of learning. A really good professional development experience online is going to have as many media as are feasible, from wikis to social bookmarking to asynchronous discussions to synchronous chats to streaming videos, because that's how we create that ecology.

JSD: What is research telling us so far about how online professional development compares to face-to-face, and what else do we need to know?

Dede: For a long time, there was direct comparative research between online learning and face-to-face learning that tried to establish whether online learning was somehow equivalent or whether it was inferior. And that literature kept coming back with the conclusion "no significant differences." On the one hand, this was reassuring to people who were worried that online was inferior, but on another level, it just showed that the research was off target, because there were significant differences. It's just that we weren't using the kinds of research instruments that were capable of measuring the significant differences. There were significant differences in which people were learning with each method, how people were learning, and how people were feeling about it.

Now, research that compares online to face-to-face is much more nuanced. We really try to examine what works when, or for whom, and why. So face-to-face will work better for some people than others, online will work better for some people than others. If there's a way that we can predict, and teachers can predict, what's going to work well for them to fulfill a specific need that they have, then we can customize something that is going to meet that need. For any specific capability that we want teachers to develop, some are going to want to do it online only, some are going to want to do it face-to-face only, and many are going to want to do it blended.

JSD: I've heard an assumption that there is a huge generational difference in how people respond to new technologies. Are you seeing that this assumption holds true — that people who have been in the field longer are less likely to embrace using technologies, whether it's for professional development or for use with students, and that younger educators are more adept and more willing to jump in and try new things?

Dede: There is a part of that discussion that's on target and a part of that discussion that's off target. We do know that there are media-based learning styles, and that people who use a particular medium have their learning strengths and their learning preferences shaped by the fact that they use that medium. An example that I frequently use is word processing. Unfortunately, I'm old enough that I remember the world before word processing. I did my doctoral thesis with a typewriter and correction tape and Wite-Out, which was a nightmare. When word processors became available, I originally used them as I used a typewriter. That is, I'd think for a couple of minutes, and I'd put a sentence down that was as close to perfect as I could get it, because I knew how hard it was to change what was written on a typewriter. And now, like everybody else, I use a word processor in a completely different way, where I think for 10 seconds and put something down that's probably not very good at all, and then I work for the other

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minute and 50 seconds on doing successive revisions of it. It's a much more powerful way of writing. Nobody taught me to change how I write. It's just something that I fell into because the tool made that powerful. And that happens with all the media that we use. So that part of it is accurate, that people's pattern of media usage determines a lot about how they like to learn.

The part that's off target is the assumption that older people don't use media, or at least don't use modern media, and younger people do. In fact, research shows us that this assumption is unfounded. We see that there are people like me that have neomillenial learning styles,

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like kids who are 10, because we're so involved with the different media of today, and there are kids who are 10 who have learning styles that might be similar to a 70-year-old person who doesn't use media at all, because they don't use media at all. The digital natives/digital immigrants argument is not accurate, but what is true is that you have to design professional development for people who have a range of learning strengths and preferences, because regardless of their age, they're coming out of a range of how they use media.

JSD: How does the increasing use of social networking tools for personal and professional purposes change the online professional development landscape?

Dede: Let me give you a really simple example that I use in my own teaching at Harvard. I teach a blended course, partly face-to-face and partly online. I use academic social bookmarking. At the start of every semester, I show the students who don't already do bookmarking how to take a tool like Diigo and bookmark things. And I tell them that, if they're out messing around on the Internet and they come across something they think is related to the course, they should bookmark it and make one of the tags the course number. Then I have an RSS feed set up on the top of the course

site so that every day, five or 10 or 15 different bookmarks are showing up from the 40-something students in the course, who are sharing what they're finding on the Internet that they think is related to the class.

When you think about something like this from a professional development perspective rather than as a means of casually sharing resources you find, it can become very powerful. Students find things that I would not find, even though, in a sense, I'm paid to find things in this field. Some of those can be very useful, so they enrich the course experience. And when I do use those things, it gives the students a real sense of ownership and co-creating that's very engaging and that helps them buy in to what's happening. There's a sense that it's not an expert transmitting information to novices, but a community of people putting the elephant together, where one understands the trunk and one the ear and one the tail and so on. That's exactly what we know is effective in professional development — teachers have knowledge and experience that they bring to the table. So these Web 2.0 tools — social bookmarking, video sharing, social networking, wikis, all the things that let people create and share knowledge — are really very powerful for professional development because they reinforce the message that we want professional development to be an experience where everybody learns from everybody else. And we're also modeling what we want teachers to do with students, which is to create active learning situations, where everybody learns from everybody else. So the medium is reinforcing the message.

JSD: How does that play out in networks and communities and teams? What's the online element to educators learning and working together and pushing their practice forward?

Dede: The strength of the online element is that the learning community can be widely distributed. Even if there isn't somebody locally that you regard as a peer whom you could learn from and share with, out on the Internet, there's a bunch of people who wear exactly your shoes. When you're learning online, you have direct access to them. The whole idea behind designing a learning community, whether it's face-to-face, online, or blended, is that it has to be rewarding enough for each of its participants that they'll participate regularly even though they're busy and that they will share their knowledge with other people in the community, know-

ing that in turn the community is going to share with them and help them. That's a complicated culture to set up and to maintain. Web 2.0 tools offer a lot of help with that, because it makes the process of sharing things that are very concrete and that are interesting to learn from much easier than was true before Web 2.0. For example, teachers like to share student products. They like to share video clips of lessons that they've done and get feedback on how those are going. They like to share fairly complex artifacts, in other words, and those are more easily shared online than they are shared by somehow lugging something into a face-to-face workshop. However, while there's a lot of power to the online experience, online is not magic. Just setting up a social networking site does not mean that you have a com-

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munity. In fact, the challenging issues are not the technical issues, they are the cultural issues of getting the community going.

JSD: The same is true in face-to-face communities — for example, the time and energy that goes into establishing trust and a shared sense of goals and mission and so on. What are the difficulties and benefits of building community online?

Dede: The benefit of building a community online is that many people feel disinhibited online. They're more likely to express themselves online than they are sitting in a face-to-face group, even teachers, even with skilled facilitation. The counterargument to that, though, is that it may be harder to build trust, because face-to-face you have a greater bandwidth with the other people, and so you see what they look like and you get a feel from them, using all the nonverbal dimensions of human interaction. It may be easier for you to feel you know them well enough that you can take some risks with them. Whereas online, where you're in a low-bandwidth medium, you really don't know some things about other people to the same depth that you would face-to-face.

Online design often involves culture building in a different way than face-to-face culture building. In a face-to-face setting, you're trying to take advantage of high bandwidth and nonverbal interaction and highly social synchronous interaction. Online, you're trying to

take advantage of being able to richly share complicated things and foster extended discussions about them. We're still learning to do the latter, since we know less about how to build effective cultures online. As with anything else, we're learning through experience and through research, and hopefully then sharing those insights, so it becomes easier over time.

JSD: From whom do you learn? Are there resources out there to support you as an online leader?

Dede: Yes, definitely. The book that my colleagues and I put together in 2006 on online professional development came out of the research conference held at Harvard in 2005, where we looked at 10 exemplary models of online professional development at that time. These projects had been around for awhile and had some research evidence that they were effective, and we talked about how the models were similar and different and what kind of design strategies that might suggest. Now, with Web 2.0, it's even easier to do that kind of sharing without having to create a research conference at Harvard and bring everyone together for a few days and have papers written in advance so that people can learn from each other. We have a much richer set of tools that can be used to share across distance. There are a lot of different models out there now. Many of them are not very good, but quite a few of them are, and as we talk with one another about our successes and our challenges, it's a rich dialogue that can only help the field. The technology is fueling a kind of evolution that was more difficult five years ago than it is today.

JSD: It's been four years since you put that book together. What are you seeing now that excites you? What models are changing the field?

Dede: There are two big changes in the last four years that are really dramatically opening up new possibilities. They're not small changes. One is the Web 2.0 tools, because the models that we looked at in that book were really prior to the explosion of Web 2.0. And the other is immersive interfaces, because the ability to meet inside of a shared virtual world can also be very powerful for learning. This is less well-developed in our thinking about professional development, but there's an enormous upside potential. When teachers are able to immerse themselves together in a shared virtual classroom environment and be very specific about aspects of the use of space and time effectively within a partic-

ular kind of classroom setting, that's going to greatly enrich the discussions that they're able to have, just as going on a physical tour of another school can greatly enrich your own thinking and your own discussions. It's not simple to set up these virtual environments for professional development; we have a lot to learn about how to do those well. But I do think that they are going to be very powerful as they come along.

JSD: Where will these immersive learning experiences come from for professional development? Will they come from people demanding it, or developers seeing this as an opportunity, or a transition from gaming?

Dede: We're finding that immersion is powerful for learning, and there is growing evidence that games and simulations that are immersive are very effective for learning certain kinds of things. Recently, I was part of a National Research Council workshop on games and simulations and science education (see papers from this meeting at www7.nationalacademies.org/bose/Gaming_Sims_Commissioned_Papers.html).

There's a growing amount of research evidence that this can be very powerful for learning scientific inquiry and scientific practices and scientific concepts. Well, teaching is like science. It's a complicated profession in which content knowledge and process knowledge and culture are all important, as they are in science, and so if we can use immersive interfaces to teach science, we can use immersive interfaces to help us teach teaching. The momentum for this is going to come from an understanding that there's evidence that shows that this can be powerful, that it can complement how we learn in the real world, by giving us virtual analogues of the real world.

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